GANSpace: Discovering Interpretable GAN Controls

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Abstract

This paper describes a simple technique to analyze Generative Adversarial Networks (GANs) and create interpretable controls for image synthesis, such as change of viewpoint, aging, lighting, and time of day. We identify important latent directions based on Principal Components Analysis (PCA) applied either in latent space or feature space. Then, we show that a large number of interpretable controls can be defined by layer-wise perturbation along the principal directions. Moreover, we show that BigGAN can be controlled with layer-wise inputs in a StyleGAN-like manner. We show results on different GANs trained on various datasets, and demonstrate good qualitative matches to edit directions found through earlier supervised approaches.